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Claim 36. (Once Amended) The purified glycopolypeptide of claim 34, wherein the polynucleotide of step (a) encodes a polypeptide comprising a sequence from position 310 to position 345 of SEQ ID NO: 1 wherein at least one amino acid has been altered while preserving the human-species specific glycosylation of the glycopolypeptide. [any one or more of amino acids at positions 310; 320; 323; 326; 328; 329; 332; 334; 335; 337; 339; 341; 342 and 345 optionally are substituted with tyr; asp; gln; asn, glu, gln, ile, pro, phe, cys; ala, ile; ser; lys; lys; lys; met; iso, met; thr; asn; and lys respectively.]

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Claim 37. (Once Amended) A purified glycopolypeptide that comprises carbohydrate and that can bind human spermatozoa at least 10 times as strong as an equivalent molar amount of mouse ZP3, wherein the amino acid sequence of the glycopolypeptide comprises a sequence from position 310 to position 345 of SEQ ID NO: 1 wherein at least one amino acid has been altered while preserving the human-species specific glycosylation of the glycopolypeptide. [and wherein any one or more of amino acids at positions 310; 320; 323; 326; 328; 329; 332; 334; 335; 337; 339; 341; 342 and 345 optionally are substituted with tyr; asp; gln; asn, glu, gln, ile, pro, phe, cys; ala, ile; ser; lys; lys; lys; met; iso, met; thr; asn; and lys respectively.]

Claim 38. (Once Amended) A glycopolypeptide that can bind human spermatozoa at least 10 times as strong as an equivalent molar amount of mouse ZP3 wherein the polypeptide portion of the glycopolypeptide is smaller than 25kd and includes a core region having a sequence shown in SEQ ID NO: 1 wherein at least one amino acid has been altered while preserving the human-species specific glycosylation of the glycopolypeptide. [one or more amino acids optionally are substituted at positions 310; 320; 323; 326; 328; 329; 332; 334; 335; 337; 339; 341; 342 and 345 with tyr; asp; gln; asn, glu, gln, ile, pro, phe, cys; ala, ile; ser; lys; lys; lys; met; iso, met; thr; asn; and lys respectively.]

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Delete claim 41 without prejudice or disclaimer.

Add the following claims.

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-- 44. A purified glycopolypeptide of 65kd to 100kd that can bind human spermatozoa at a glycopolypeptide concentration below 1 µg/ml and induce an acrosome reaction within one

hour upon binding, wherein said glycopolyptide comprises an amino acid sequence that is more than 54% homologous to the following sequence:

SerTrpPheProValGlnGlyProAlaAspIleCysGlnCysCysAsnLysGly
AspCysGlyThrProSerHisSerArgArgGluProHisValMetSerGlnTrp
SerArgSerValSer.

45. A glycopolyptide comprising between 41 and 400 amino acid that can bind human spermatozoa at a glycopolyptide concentration below 1 µg/ml and induce an acrosome reaction within one hour upon binding, wherein said glycopolyptide comprises an amino acid sequence that is at least 54% homologous to the following sequence:

SerTrpPheProValGlnGlyProAlaAspIleCysGlnCysCysAsnLysGly
AspCysGlyThrProSerHisSerArgArgGlnProHisValMetSerGlnTrp
SerArgSerValSer,

and wherein the fifth amino acid residue from the carboxyl terminus of said amino acid sequence of said glycopolyptide is O-glycosylated.

46. The glycopolyptide of claim 45, wherein said glycopolyptide comprises an amino acid sequence that is at least 75% homologous to the following sequence:

SerTrpPheProValGlnGlyProAlaAspIleCysGlnCysCysAsnLysGly
AspCysGlyThrProSerHisSerArgArgGlnProHisValMetSerGlnTrp
SerArgSerValSer.

47. The glycoprotein of claim 45, wherein the glycoprotein comprises the following amino acid sequence:

SerTrpPheProValGlnGlyProAlaAspIleCysGlnCysCysAsnLysGlyAspCysGlyThrProSerHisS
erArgArgGluProHisValMetSerGlnTrpSerArgSerValSer.- -

Remarks

Claims 25 to 43 are pending. Without acquiescing in any rejection in this response, applicants cancel claim 41 without prejudice or disclaimer, amend claims 28, 36, 37 and 38, and add claims 44 to 47 to emphasize the biological characteristics of their claimed